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PICTURE PROCESSING SYSTEM for selective display

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United States Patent [19]

Harada et al.

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[45] Date of Patent: Jan. 31, 1989

[34] PICTURE PROCESSING SYSTEM FOR
SELECTIVE DISPLAY

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abandoned.

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340/707

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360/72.2, 33.1, 35.1, 9.1; 358/333, 183, 342, 22;
340/721, 723, 724, 731, 747, 707

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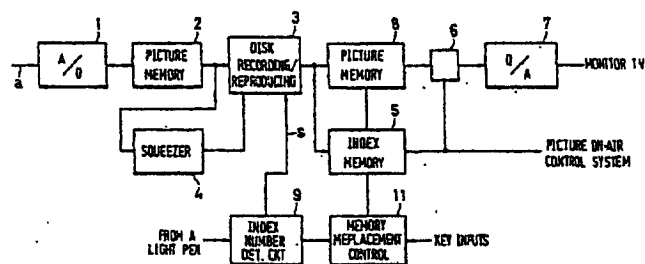
Primary Examiner—Alan Faber

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Mackiewicz & Norris

[57] ABSTRACT

A picture processing system for displaying a plurality of still pictures recorded in a recording member. The recording member has index tracks for storing a series of information representative of a plurality of squeezed still pictures corresponding to the original still pictures. A group of squeezed still pictures is displayed in multiple segmented areas formed on an index screen accompanied by reference numerals. A light pen and a sensing circuit is provided for rearranging the index screen. The light pen detects the position of said segmented areas and intermediate regions respectively provided between two adjacent areas for processing the rearrangement.

9 Claims, 4 Drawing Sheets



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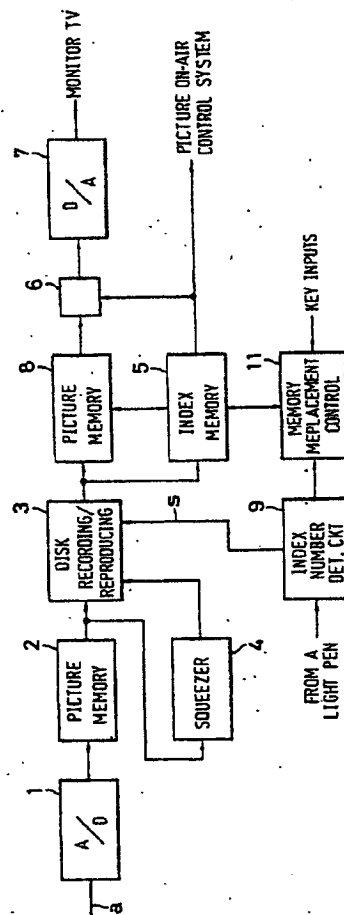
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FIG. 1



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FIG. 2

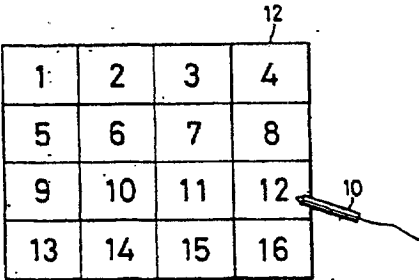
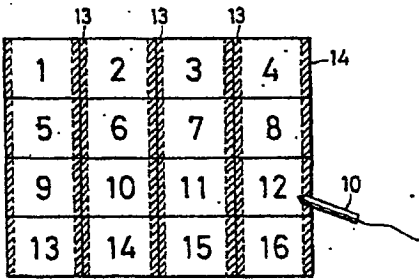


FIG. 3



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FIG. 4

1	5	2	3	14
4	6	7	8	
9	10	11	12	
13	14	15	16	

FIG. 5

17		15		16
①	②	③	④	
⑤	⑥	⑦	⑧	
⑨	⑩	⑪	⑫	
⑬	⑭	⑮	⑯	

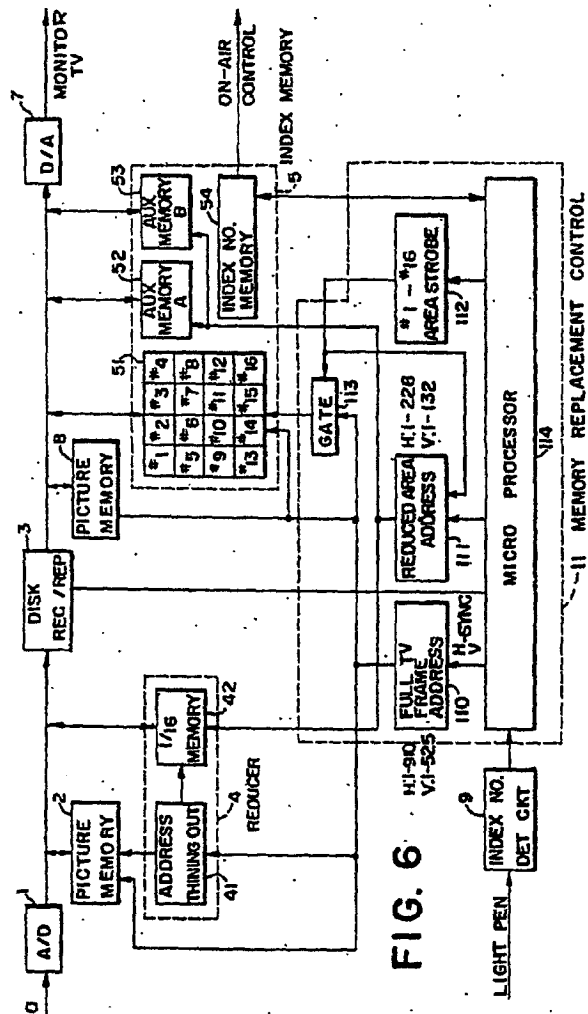
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PICTURE PROCESSING SYSTEM FOR SELECTIVE DISPLAY

This is a continuation-in-part of U.S. application Ser. No. 455,115, filed Jan. 3, 1983, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a picture processing apparatus for selecting a desired picture from a plurality of still pictures formed on a monitor screen by means of selecting means and rearranging them in a desired order.

2. Description of the Prior Art

A picture display system for reproducing digital information representative of a plurality of still pictures (about 100 fields, for example) recorded in a disk type recording medium and displaying it on a monitor has been well known as prior art. Such a system as this is generally used, in a TV station for example, for a programming apparatus of a picture on-air control system by which programs in a predetermined order arranged in advance are automatically progressed by use of a plurality of VTRs. In this programming apparatus, picture or character information representative of the contents of each program such as news program or commercial program is recorded in a floppy disk and the like in the form of one still picture information. This information is rearranged in the desired order while reading it out at the time of making the program. The picture on-air control system is controlled with the rearranged information.

In this type of programming apparatus, it generally takes approximately 0.4 sec. to reproduce the still picture of one field and a time interval of 1.6 sec. is required for the case of color picture consisting of four fields in one unit of color frame. Thus, an extremely large amount of time is required to find out the desired picture. Alternatively, a method of selecting the desired picture information through an index in the form of a document is conceivable but it is impossible to express the contents of the picture completely by use of the document and it also takes a lot of time to fabricate such index as mentioned above.

A picture display system was proposed by the same assignee as that of this invention in U.S. patent application Ser. No. 437,317, filed on Oct. 25, 1982, now abandoned, in which the problems mentioned above are settled. In the picture display system, a plurality of still pictures are recorded in a recording member. The recording member has index tracks for storing a series of information representatives of a plurality of squeezed still pictures corresponding to the original still pictures. An index screen is formed on which a group of squeezed still pictures is displayed in multiple segmented areas prepared on the screen accompanied by reference numerals.

By using this type of index screen, program arrangement tasks can drastically be simplified. In short, the contents of the plurality of still pictures can be observed at a glance by looking into the index screen without having to reproduce and display them one by one. In addition, a program advancing schedule can be completed by selecting the pictures on the index screen in the desired order.

It will also be possible to know the schedule of programs through the index screen. In short, the scheduled programs can be displayed on the index screen with an

arrangement of squeezed picture elements. The programmed index screen can be formed by selecting the squeezed pictures in order of program, storing the selected picture information in a picture memory one after another and then reading out the programmed information. In this case, alteration or rearrangement of program requires replacement or insertion of the squeezed pictures on the index screen, indicating an arrangement in accordance with a certain schedule.

Generally, the selection, replacement and insertion of the squeezed pictures on the index screen are achieved through a key input unit including ten keys for data input and function keys such as "Insert" key, "Change" key or "Execution" key for operation command.

The key input operation is very troublesome when the alteration or rearrangement of program is requested during on-air of the program. And the key input operation is apt to cause errors, resulting in on-air accidents.

SUMMARY OF THE INVENTION

It is therefore a primary object of the present invention to settle such drawbacks as mentioned above, that is, to accomplish quick selection of the desired pictures from a plurality of squeezed still pictures on the index screen.

Another object of the present invention is to accomplish simple and accurate insertion of the selected pictures into the desired positions between the still pictures arranged on the index screen.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, its construction and mode of operation, reference is made to the following description of preferred embodiments and the appended drawings in which:

FIG. 1 shows a block diagram of a picture processing apparatus in accordance with the present invention;

FIG. 2 shows a front view of an index screen used for explaining quick selection of the desired pictures;

FIGS. 3 and 4 show views similar to FIG. 2 and used for explaining simple and accurate insertion of the desired pictures; and

FIG. 5 shows a plane view of an X-Y coordinate input device to be mounted on a screen.

FIG. 6 shows a detailed block diagram of the system of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1 wherein a block diagram of the picture processing apparatus in accordance with the present invention is illustrated, an input video signal *a* is converted into a series of digital signals and the still picture information of one color frame is written into a picture memory 2. The outputs read out of the memory 2 are supplied to a disk type recording/reproducing apparatus 3 and then recorded therein. By repeating this recording operation, picture information corresponding to a plurality of still pictures can be recorded to the disk. The speed for reading the picture memory 2 is modified so as to match the speed of rotation of the disk.

The outputs of the picture memory 2 are also provided to a "squeezer" or reducer circuit 4. The reducer circuit 4 has a specific function to reduce or "squeeze" the picture size to one-sixteenth the original size and is so constructed that three scanning lines are thinned or removed out of four scanning lines and three sampling points on the scanning line are thinned or removed out

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of four sampling points at the time of analog/digital conversion, for example. The outputs of the reducer circuit 4 are fed to the disk type recording/reproducing apparatus 3 and recorded in a predetermined part, that is, tracks assigned for index recording.

In reproduction operation, the outputs reproduced from the index track in the disk type recording/reproducing apparatus 3 are first supplied to an index memory 5 and recorded therein as information for one index screen. The outputs of the index memory 5 are then delivered to a D/A converter 7 through a changeover device 6 and converted therein to analog picture signals. The outputs of the D/A converter 7 are applied to a monitor television (TV) and then displayed on a screen thereof.

As clearly indicated in FIG. 2, the screen 12 of the monitor TV is divided into a plurality of segments (in this example, 16 segments) and each of the "squeezed" still pictures is displayed on each of the segments (1 to 16). To the respective segments, the reference numerals 1 to 16 are assigned by superimposing them on the pictures or by noting them down on a transparent plate located in front of the screen. In this example, the screen 12, including a group of "squeezed" still pictures and reference numerals will be used as an index screen.

Like these, the required information can be selected by looking into the index screen 12 of FIG. 2. The selected still picture information will be reproduced by giving instructions representative of the index reference numerals to the disk type recording/reproducing apparatus 3, which can access in a random manner to any one of the required tracks. The reproduced signals will be recorded in the picture memory 8. As previously described, the outputs of the picture memory 8 will be fed to the monitor TV via the changeover device 6 and the D/A converter 7 and displayed on the screen 12 thereof as a selected still picture.

In this paragraph, the selection of the desired still pictures by utilization of the index screen 12 illustrated in FIG. 2 will be concretely explained. The index reference data representing a respective "squeezed" picture can be detected by means of a light pen 10. The information corresponding to the desired index number is detected through a detecting circuit 9 by directing the light pen 10 onto one of the "squeezed" still pictures to be selected.

The output of the detecting circuit 9 is provided to the disk type recording/reproducing apparatus 3 on line S. A selected still picture information is reproduced therefrom, and then recorded in the picture memory 8. The outputs of the picture memory 8 are provided to the monitor TV through the changeover device 6 and the D/A converter 7 and displayed on the screen thereof as a selected still picture pattern.

Next, the selection, replacement and insertion operation for "squeezed" index pictures in the case where a second index screen 14 shown in FIG. 3 is utilized instead of the first index screen 12 will be explained. As clearly indicated in FIG. 3, the second index screen 14 is provided with intermediate regions 13 between the respective segments. The intermediate regions 13 can be represented by gate signals produced on the basis of horizontal and vertical sync signals and detected depending on the gate signals at a time when the intermediate regions 13 are designated by means of the light pen 10.

In making a desired schedule of TV programs, the operator reads out index pictures from the apparatus 3

just as mentioned before and then selects the picture displayed on the index screen 14 in the desired order by means of the light pen 10 to obtain a series of picture selection information. The output of the index number detecting circuit 9 is fed to a memory replacement control circuit 11 in response to the key input signals selected on a keyboard (not shown). The "squeezed" picture information selected through this step is transferred to the picture memory 8 in the selected order. At the same time, the index reference numbers corresponding to the selected pictures are stored in a schedule memory portion of the index memory 5 in the designated order.

When a series of schedules have been completed, the contents of the picture memory 8 are transferred back to the index memory 8 through the manipulation of an "End" key on the keyboard. The contents of the index memory are displayed on the monitor screen through the changeover device 6 and the D/A converter 7 and the scheduled program sequence 1, 2, 3 . . . can be observed on the so called multi-screen 14 shown in FIG. 3.

The sequence of the pictures in the programs may be modified by instructing the picture on the multi-screen by means of the light pen. For example, when the sequence of programs represented by the "squeezed" pictures 6, 7 for example, is to be replaced for example by rearranging the order of that pair of pictures in the sequence, the operator designates the screen segments 6 and 7 to be changed by means of the light pen 10 and manipulates a "change" key on the keyboard. As the result, the memory replacement control circuit 11 is operated so that the "squeezed" picture information corresponding to regions 6, 7 in the index memory 5 is mutually replaced and, at the same time, the index reference numerals written in the schedule memory portion within the index memory 5 are mutually replaced.

Next, rearrangement of the index memory 5 by the operation of inserting another program into the already-scheduled programs will be explained in detail in connection with ordinal methods.

In one typical method, it is assumed that the "squeezed" picture 5 is to be inserted between the "squeezed" pictures 1 and 2, for example. The operator first designates the picture 1 and then the picture 5 by use of the light pen 10 and thereafter manipulates an "insert" key on the keyboard. The memory replacement control circuit 11 is thereby operated similarly to the above-mentioned replacement operation. As a result, the picture 5 is inserted between the pictures 1 and 2 and the pictures 2, 3 and 4 are shifted by one segment, in order, respectively. This insertion process, however, is liable to lead to error because, when the operator wishes to insert the picture 5 before the picture 2, he may erroneously designate the pictures 2 and 5 in this order by use of the light pen 10 and thereafter manipulate the "insert" key without following the correct steps: 1-->5-->"insert" key. This operation would result in the mistaken rearrangement: 1, 2, 5, 3 and 4.

To prevent such erroneous operation as this, in this embodiment, the intermediate region 13 is provided between the respective segments on the index screen, as indicated by the hatched region in FIG. 3. As described previously, this intermediate region 13 can be represented by the gate signals produced based on the horizontal and vertical sync signals and it can be detected on the basis of the gate signal obtained when the operator designates the intermediate region 13 by use of the light pen 10.

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Now it is assumed that the picture 5 is to be inserted between the pictures 1 and 2 by utilization of the intermediate region 13. In this case, the operator first designates the picture 5 and then the intermediate region 13 located between the pictures 1 and 2 and thereafter manipulates the "Insert" key on the keyboard. The respective outputs of the index number detecting circuit 9 and the "Insert" key are thereby fed to the memory replacement control circuit 11 and the insert operation for the "squeezed" pictures and the reference numerals is carried out. As a result, such a rearranged program as shown on the monitor screen 14 in FIG. 6 is obtained. As clearly understood from the foregoing, the aforesaid insertion process is extremely simple and any erroneous operation can be avoided.

An X-Y coordinate input device may be used as well as the light pen 10. This input device may be a conventional one which is formed by arranging transparent electro-conductive films and the like in the form of a key switch train 17 in a form of matrix as indicated in FIG. 5. The necessary pictures can be selected by disposing the transparent input device over the monitor screen so as to touch it directly and manipulating some of the coordinate keys corresponding to the "squeezed" index pictures on the monitor screen.

In addition, if a key switch train 15 corresponding to the intermediate region 13 of FIG. 3 is arranged between the key switch trains 17 located on the respective picture segments as shown in FIG. 5, they can be used at the time of insertion operation. Since the insertion operation is just similar to the case of the light pen, the operator first selects the pictures to be inserted by use of the key switch train 17 and then manipulates the key switch train 15 showing the position for insertion.

As clearly understood from the foregoing, the picture processing apparatus of this invention is so constructed that the "squeezed" still pictures can be displayed on one screen divided into a plurality of segmented areas and each segment and the intermediate between the segments can be selected on the screen. Rearrangement operation of the multiple segmented screen, such as insertion operation, can be easily achieved without errors, by designating one of the segments and one of the intermediate regions.

FIG. 6 shows a detailed block diagram of the system of FIG. 1. In FIG. 6, a digitized video signal from the analog-digital converter 1 is stored in the picture memory 2 having a size corresponding to a full TV frame area. A write address is supplied to the memory 2 from a full TV frame address generator 110 for recording the full frame picture data. The address consists of horizontal picture element and vertical addresses 1-910 incremented by one for each horizontal picture element and vertical addresses 1-525 incremented by one for each horizontal line. The content of the picture memory 2 is read out to be recorded on a track of the disk recording/reproducing apparatus 3. Read address is supplied from the full TV frame address generator 110 to the picture memory 2 at a slow rate corresponding to the recording speed of the disk apparatus 3.

For reducing a full frame image into 1/16 of the original, a read address is supplied from the full TV frame address generator 110 through an address circuit 41 which passes only addresses having a bit pattern (01) in the rightmost two bits thereof. Addresses having other bit patterns (00, 10 and 11) in the rightmost two bits are not passed. It means that horizontal and vertical addresses representatives of 1, 5, 9 ... are supplied to

the picture memory 2 to read out a reduced picture being one-fourth both in horizontal and vertical directions. At the same time, a write address is supplied to a 1/16 memory 42 for storing the read-out reduced picture data from the picture memory 2. The write address is identical with the thinned out address from the address thinning out circuit 41 but the rightmost two bits (01) thereof are deleted. The write address designates 1/16-sized memory area for storing the reduced picture image and consists of horizontal H and vertical V addresses incrementing by one, representing 1-228 (H) and 1-132 (V).

The content of 1/16 memory 42 are read out and transferred to the disk apparatus 3 to be recorded on an index track thereof. A read address is supplied to the 1/16 memory 42 from a reduced area address generator 111 at a slow rate corresponding to the recording speed of the disk. The address generator 111 generates horizontal and vertical addresses H-address 1-228 and V-address 1-132 respectively.

The control circuit of the disk drive 3 selects still picture tracks and reduced picture tracks in accordance with the signal to be recorded under the control of micro processor 114.

For reproduction, data representing a reproduced picture is stored in the picture memory 8 and the stored data is read out to a monitor TV 12 (See FIG. 2) through the digital-analog converter 7. A write address and a read address are generated in the full TV frame address generator 110 and supplied to the picture memory 8. The rate of the write address is synchronized with the reproduction from disk 3 and the rate of the read address is synchronized with the time base of the real video signal.

The index memory 5 comprises a full TV frame memory 51 for storing data corresponding to one index still picture which consists of 16 segmented areas in each of which a reduced picture corresponding to one full frame TV still picture is displayed. Each of the multiple segmented areas corresponds to a predetermined location in the memory 51. Each of the predetermined locations has a unique address and stores the digital signals (i.e. data) for one reduced still picture image. Write and read addresses are supplied in the same manner with the write and read operation of the picture memory 8, thus displaying an index picture on the monitor screen.

The index memory 5 further comprises two auxiliary memories 52 and 53 labeled as "A" and "B", which are employed for memory replacement control. Each of the auxiliary memories is the same size as the 1/16 memory 42 for storing the data of one reduced picture. The reduced area address generator 111 supplies write and read addresses (1-228 (H) and 1-132 (V)).

An area strobe signal generator 112 is provided in the memory replacement control circuit 11. The generator 112 generates a strobe signal corresponding to one of the segmented areas #1-#16 within one index picture. The strobe signal is generated in synchronism with the full frame address generation by the full frame address generator 110.

Rearrangement of the reduced still pictures in the index picture will now be explained. "Rearrangement" and similar words are used to refer generically to either the exchange of locations of two reduced still pictures in the index picture or the movement of one reduced still picture image at an initial location in the index picture in a new location between a pair of adjacent reduced still pictures in the index picture. With respect

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7 to the described embodiment, rearrangement and similar terms refer to the steps of relocating reduced still picture image digital signals in the index memory among the predetermined memory locations to accomplish the aforesaid modifications to the index picture.

For exchange of two of 16 segments in the index memory 51, the two segments, #6 and #7 for example, are designated by a light pen, the operation of which is detected by the index number detection circuit 9 and acknowledged to the micro processor 114. The processor 11 gives a command signal to the area strobe signal generator 112 to generate #6 and #7 strobe signals in that order. The strobe signals are supplied to a gate circuit 113 for strobing a full frame read address from the address generator 118.

Strobed addresses corresponding to segments #6 and #7 are fed in this order to the index memory 51 for reading out the data in the segments #6 and #7. Simultaneously, write addresses are supplied from the reduced area address generator 111 to the auxiliary memories 52 and 53 in synchronism with respective timing of the strobe signals. As a result, contents of the segments #6 and #7 are respectively transferred to the memories 52 and 53 (#6→A, #7→B).

Then, strobe signals for segments #7 and #6 are generated in that order to strobe and feed write addresses from the full TV frame address generator 110 to the index memory 51 through the gate circuit 113, while read addresses are supplied to the auxiliary memories 52 and 53 in synchronism with the strobe signals. As a result, contents of the auxiliary memories 52 and 53 are retransferred to the segment areas #7 and #6 (A→#7, B→#6), thus completing the exchange of reduced picture digital signals stored in the index picture memory between the index memory locations for multiple segment locations #6 and #7.

For insertion of one selected segment between two adjacent segments, a segment, for example, is first designated and then one of intermediate regions 13 located between a pair of segments, the region 13 between segments #1 and #2, for example, is designated by a light pen. The detecting circuit 9 detects these designations and sends appropriate signals to the micro processor 114. The micro processor 114 controls the full TV frame address generator 110, reduced area address generator 111 and area strobe signal generator 112 in the similar manner as explained in the exchange mode. Following five steps are carried out in the insertion operation.

(1)	#5→A
(2)	#4→B→#3
(3)	#3→B→#4
(4)	#2→B→#3
(5)	A→#2

Segment #5 is moved to memory 52 for storage. Each segment #4 through #2 is moved to the remaining memory 53 (B) and then to the next higher segment location freeing the segment 2 location into which the contents of memory (52) is read. Consequently, the reduced picture in the #5 segment is inserted between segments #1 and #2 so as to complete the rearrangement shown in FIG. 4.

An index number memory 54 is employed in the index memory 5. In the index number memory 54, index numbers corresponding to the arrangement of index segment pictures on the index screen are stored under

8 control of the micro processor 114. The content of the index number memory 54 is read out as a program schedule information to be used for on air control.

This invention having been described in its preferred embodiments, it is clear that numerous modifications and changes may be made by those skilled in the art without departing from the broader scope and spirit of the invention.

What is claimed is:

1. A picture processing system comprising a recording member in which a plurality of full TV screen still picture digital signals is recorded, each signal corresponding to a different still picture, and a monitoring means for reproducing one of said still picture digital signals and displaying the corresponding still picture on a screen, said recording member having an index recording portion in which a second plurality of digital signals is recorded, each digital signal of the second plurality corresponding to a reduced still picture and one reduced still picture digital signal being provided for each still picture, and said monitoring means including: index memory means for storing a group of reduced still picture digital signals from said recording member in predetermined memory locations as a single full TV screen index picture; circuit means for coupling the index memory means and said screen to display the group of said reduced still pictures stored in said index memory means in multiple segmented areas on said screen as an index picture; selecting means for designating multiple segmented areas on said screen to select reduced still pictures displayed in said areas; a detecting circuit for detecting the position of segmented areas designated by said selecting means on the basis of horizontal and vertical sync signals for said screen, said detecting circuit including means for detecting intermediate regions respectively provided between adjacent segmented areas on said screen; and memory control means for rearranging the locations of said reduced still picture signals stored in said index memory means on the basis of the output of said selecting means to rearrange the location of reduced still pictures in said index picture, said memory control means receiving a detecting signal corresponding to one of said intermediate regions for rearranging the contents of said index memory so that a selective one of said displayed reduced still pictures is interposed between two adjacent reduced pictures by designating an intermediate region between said two adjacent reduced pictures displayed on said screen.

2. A picture processing system according to claim 1, wherein said selecting means further comprises a light pen, said detecting circuit detecting the position of said segmented areas designated by said light pen on the basis of horizontal and vertical sync signals for said screen.

3. A picture processing system according to claim 1, wherein said selecting means comprises a transparent keyboard unit provided on said screen, said keyboard unit comprising a matrix of keys, each key corresponding to each of said segmented areas.

4. A picture processing system according to claim 3, wherein said transparent keyboard unit further comprises another matrix of keys, each key corresponding to each intermediate region respectively provided between each pair of adjacent segmented areas and said memory control means receives the output of one of said another matrix of keys corresponding to one of said

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intermediate regions for rearranging the contents of said index memory so that a selected one of said displayed reduced pictures is interposed between two adjacent reduced pictures by designating an intermediate region between said two adjacent reduced pictures displayed on said screen.

5. A picture processing system according to claim 3, wherein said transparent keyboard unit further comprises another matrix of keys, each key respectively corresponding to an intermediate region between different pairs of adjacent segmented areas, said keys at the intermediate regions being utilized to rearrange the arrangement of said reduced still pictures on said screen.

6. A picture system comprising:
 a recording member in which a plurality of still picture signals are recorded; and
 a monitoring means for reproducing one of said recorded still picture signals for displaying said one still picture on a screen,
 said reproducing member having an index recording portion in which a series of reduced picture signals representative of a plurality of reduced still pictures, each of which correspond to each of said still pictures, is recorded,
 a group of said reduced still pictures being selectively displayed in multiple segmented areas formed on said screen as an index to said still pictures, said monitoring means comprising selecting means of a type operative by directly pointing to the surface of said screen for designating one of said multiple segmented areas to select one of said reduced still pictures, and a detecting circuit for detecting the position of said segmented areas designated by said selecting means on the basis of horizontal and vertical sync signals for said screen, said detecting circuit including means for detecting intermediate regions respectively provided between adjacent segmented areas on said screen, a detecting output thereof being utilized to rearrange the arrangement of said reduced still pictures on said screen, and said monitoring means having a random access reproduction function to reproduce one of design-

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ated still pictures in response to designation with said selecting means.

7. A picture processing system according to claim 6, wherein said selecting means further comprises a light pen, said detecting circuit detecting the position of said segmented areas designated by said light pen on the basis of horizontal and vertical sync signals for said screen.

8. A picture comprising system according to claim 6, wherein said selecting means further comprises a transparent keyboard unit provided on said screen, said keyboard unit comprising a matrix of keys corresponding to said segmented areas.

9. A picture processing system comprising:

a random access recording and playback member having a main recording portion in which a plurality of still picture signals are electronically recorded and an index recording portion in which a plurality of reduced still picture signals are electronically recorded, each of the reduced still pictures corresponding to a different one of said still pictures; and
 a monitoring means including: a screen for displaying either a group of said reduced still pictures in multiple segmented areas formed on said screen as an index to said still pictures or one of said still pictures; selecting means for designating one of said multiple segmented areas to select the reduced still picture displayed therein by directly pointing to the surface of said screen, and for controlling said random access recording and playback member; means for electronically recording the signal of the one still picture corresponding to the selected one of said reduced still pictures; and a detecting circuit for detecting the position of said segmented areas designated by said selecting means on the basis of horizontal and vertical sync signals for said screen, said detecting circuit including means for detecting intermediate regions respectively provided between adjacent segmented areas on said screen, a detecting output thereof being utilized to rearrange the arrangement of said reduced still pictures on said screen.

* * * * *

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CASE DOCKET NO. TS-39

862041

Sirs:

Transmitted herewith for filing is the present application for:

Inventor: ZENJI HARADA, OSAMU
TERAOKA, TSUNEO MIKADO

For: PICTURE PROCESSING SYSTEM

"EXPRESS MAIL" Mailing Label No. B63955752

Date of Deposit: May 10, 1986

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

John Jamieson, Jr., Reg. #29,546

Enclosed are:

☒ four sheets of drawing. (informal)☐ An assignment of the invention to☐ A certified copy of a application.☒ An associate power of attorney.☒ An unexecuted Declaration and Power of Attorney.
☐ A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27.☒ This is a continuation-in-part of Serial No. 455,115 filed January 3, 1983. Please transfer the drawings from the prior application to this application, and abandon said prior appln. as of the filing date accorded this appln.***
The filing fee has been calculated as shown below:

	(Col. 1)	(Col. 2)
FOR:	NO. FILED	NO. EXTRA
BASIC FEE		
TOTAL CLAIMS	11 - 20 =	0
INDEP CLAIMS	3 - 3 =	0
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENTED		

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RATE	FEE		RATE	FEE
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+55 = \$		OR	+110 = \$	
TOTAL	\$	OR	TOTAL	\$340

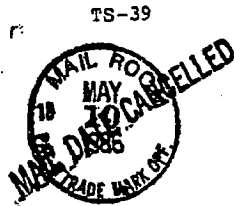
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Date: May 10, 1986

*** A duplicate copy of this sheet is enclosed for filing in the prior application file.

John Jamieson, Jr.
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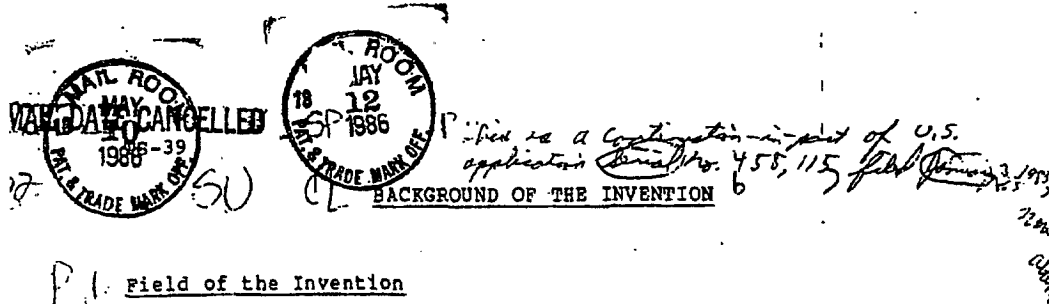
501
Title: PICTURE PROCESSING SYSTEM

Inventors: Zenji Harada, Osamu Teraoka and
Tsuneo Mikado

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Field of the Invention

This invention relates to a picture processing apparatus for selecting a desired picture from a plurality of still pictures formed on a monitor screen by means of selecting means and rearranging them in a desired order.

Description of the Prior Art

A picture display system for reproducing digital information representative of a plurality of still pictures (about 100 fields, for example) recorded in a disk type recording medium and displaying it on a monitor has been well known as prior art. Such a system as this is generally used, in a TV station for example, for a programming apparatus of a picture on-air control system by which programs in a predetermined order arranged in advance are automatically progressed by use of a plurality of VTRs. In this programming apparatus, picture or character information representative of the contents of each program such as news program or commercial program is recorded in a floppy disk and the like in the form of one still picture information. This information is rearranged in the desired order while reading it out at the time of making the program. The picture on-air control system is controlled with the rearranged information.

In this type of programming apparatus, it generally takes approximately 0.4 sec. to reproduce the still picture of one field and a time interval of 1.6 sec. is required for the case of color picture consisting of four fields in one unit of color frame.

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Thus, an extremely large amount of time is required to find out the desired pictures. Alternatively, a method of selecting the desired picture information through an index in the form of a document is conceivable but it is impossible to express the contents of the picture completely by use of the document and it also takes a lot of time to fabricate such index as mentioned above.

A picture display system was proposed by the same assignee as that of this invention in U.S. Patent Application *filed on Oct. 28, 1982, now abandoned* Serial No. 437,317, in which the problems mentioned above are settled. In the picture display system, a plurality of still pictures are recorded in a recording member. The recording member has index tracks for storing a series of information representative of a plurality of squeezed still pictures corresponding to the original still pictures. An index screen is formed on which a group of squeezed still pictures is displayed in multiple segmented areas prepared on the screen accompanied by reference numerals.

By using this type of index screen, program arrangement tasks can drastically be simplified. In short, the contents of the plurality of still pictures can be observed at a glance by looking into the index screen without having to reproduce and display them one by one. In addition, a program advancing schedule can be completed by selecting the pictures on the index screen in the desired order.

It will also be possible to know the schedule of programs through the index screen. In short, the scheduled programs can be displayed on the index screen with an arrangement of squeezed picture elements. The programmed index screen can be formed by selecting the squeezed pictures in order of program, storing the selected picture information in a picture memory one after another

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and then reading out the programmed information. In this case, alteration or rearrangement of program requires replacement or insertion of the squeezed pictures on the index screen indicating an arrangement in accordance with a certain schedule.

5 Generally, the selection, replacement and insertion of the squeezed pictures on the index screen are achieved through a key input unit including ten keys for data input and function keys such as "Insert" key, "Change" key or "Execution" key for operation command.

10 The key input operation is very troublesome when the alteration or rearrangement of program is requested during on-air of the program. And the key input operation is apt to cause errors, resulting in on-air accidents.

CL SUMMARY OF THE INVENTION

15 P It is therefore a primary object of the present invention to settle such drawbacks as mentioned above, that is, to accomplish quick selection of the desired pictures from a plurality of squeezed still pictures on the index screen.

Another object of the present invention is to accomplish
20 simple and accurate insertion of the selected pictures into the desired positions between the still pictures arranged on the index screen.

DR CL BRIEF DESCRIPTION OF THE DRAWINGS

P For a better understanding of the present invention, its
25 construction and mode of operation, reference is made to the

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following description of preferred embodiments and the appended drawings in which:

Fig. 1 shows a block diagram of a picture processing apparatus in accordance with the present invention;

Fig. 2 shows a front view of an index screen used for explaining quick selection of the desired pictures;

Figs. 3 and 4 show views similar to Fig. 2 and used for explaining simple and accurate insertion of the desired pictures; and

Fig. 5 shows a plane view of an X-Y coordinate input device to be mounted on a screen.

Fig. 6 shows a detailed block diagram of the system of Fig. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to Fig. 1 wherein a block diagram of the picture processing apparatus in accordance with the present invention is illustrated, an input video signal a is converted into a series of digital signals and the still picture information of one color frame is written into a picture memory 2. The outputs read out of the memory 2 are supplied to a disk type recording/reproducing apparatus 3 and then recorded therein. By repeating this recording operation, picture information corresponding to a plurality of still pictures can be recorded to the disk. The speed for reading the picture memory 2 is modified so as to match the speed of rotation of the disk.

The outputs of the picture memory 2 are also provided to a "squeezer" or reducer circuit 4. The reducer circuit 4 has a specific function to reduce or "squeeze" the picture size to

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one-sixteenth the original size and is so constructed that three scanning lines are thinned or removed out of four scanning lines and three sampling points on the scanning line are thinned or removed out of four sampling points at the time of analog/digital conversion, for example. The outputs of the reducer circuit 4 are fed to the disk type recording/reproducing apparatus 3 and recorded in a predetermined part, that is, tracks assigned for index recording.

In reproduction operation, the outputs reproduced from the index track in the disk type recording/reproducing apparatus 3 are first supplied to an index memory 5 and recorded therein as information for one index screen. The outputs of the index memory 5 are then delivered to a D/A converter 7 through a changeover device 6 and converted therein to analog picture signals. The outputs of the D/A converter 7 are applied to a monitor television (TV) and then displayed on a screen thereof.

As clearly indicated in Fig. 2, the screen 12 of the monitor TV is divided into a plurality of segments (in this example, 16 segments) and each of the "squeezed" still pictures is displayed on each of the segments (1 to 16). To the respective segments, the reference numerals 1 to 16 are assigned by superimposing them on the pictures or by noting them down on a transparent plate located in front of the screen. In this example, the screen 12, including a group of "squeezed" still pictures and reference numerals will be used as an index screen.

Like these, the required information can be selected by looking into the index screen 12 of Fig. 2. The selected still picture information will be reproduced by giving instructions representative of the index reference numerals to the disk type recording/reproducing apparatus 3, which can access in a random manner to any one of the required tracks. The reproduced signals

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will be recorded in the picture memory 8. As previously described, the outputs of the picture memory 8 will be fed to the monitor TV via the changeover device 6 and the D/A converter 7 and displayed on the screen 12 thereof as a selected still picture.

5 In this paragraph, the selection of the desired still pictures by utilization of the index screen 12 illustrated in Fig. 2 will be concretely explained. The index reference data representing a respective "squeezed" picture can be detected by
10 means of a light pen 10. The information corresponding to the desired index number is detected through a detecting circuit 9 by directing the light pen 10 onto one of the "squeezed" still pictures to be selected.

 The output of the detecting circuit 9 is provided to the
15 disk type recording/reproducing apparatus 3 on line S. A selected still picture information is reproduced therefrom, and then recorded in the picture memory 8. The outputs of the picture memory 8 are provided to the monitor TV through the changeover device 6 and the D/A converter 7 and displayed on the screen
20 thereof as a selected still picture pattern.

 Next, the selection, replacement and insertion operation for "squeezed" index pictures in the case where a second index screen 14 shown in Fig. 3 is utilized instead of the first index screen 12 will be explained. As clearly indicated in Fig. 3, the
25 second index screen 14 is provided with intermediate regions 13 between the respective segments. The intermediate regions 13 can be represented by gate signals produced on the basis of horizontal and vertical sync signals and detected depending on the gate signals at a time when the intermediate regions 13 are designated
30 by means of the light pen 10.

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In making a desired schedule of TV programs, the operator reads out index pictures from the apparatus 3 just as mentioned before and then selects the pictures displayed on the index screen 14 in the desired order by means of the light pen 10 to obtain a series of picture selection information. The output of the index number detecting circuit 9 is fed to a memory replacement control circuit 11 in response to the key input signals selected on a keyboard (not shown). The "squeezed" picture information selected through this step is transferred to the picture memory 8 in the selected order. At the same time, the index reference numbers corresponding to the selected pictures are stored in a schedule memory portion of the index memory 5 in the designated order.

When a series of schedules have been completed, the contents of the picture memory 8 are transferred back to the index memory 5 through the manipulation of an "End" key on the keyboard. The contents of the index memory are displayed on the monitor screen through the changeover device 6 and the D/A converter 7 and the scheduled program sequence 1, 2, 3 . . . can be observed on the so called multi-screen 14 shown in Fig. 3.

The sequence of the pictures in the programs may be modified by instructing the pictures on the multi-screen by means of the light pen. For example, when the sequence of programs represented by the "squeezed" pictures 6, 7 for example, is to be replaced for example by rearranging the order of that pair of pictures in the sequence, the operator designates the screen segments 6 and 7 to be changed by means of the light pen 10 and manipulates a "Change" key on the keyboard. As the result, the memory replacement control circuit 11 is operated so that the "squeezed" picture information corresponding to regions 6, 7 in the index memory 5 is mutually replaced and, at the same time, the

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index reference numerals written in the schedule memory portion within the index memory 5 are mutually replaced.

Next, rearrangement of the index memory 5 by the operation of inserting another program into the already-scheduled programs will be explained in detail in connection with ordinal methods.

In one typical method, it is assumed that the "squeezed" picture 5 is to be inserted between the "squeezed" pictures 1 and 2, for example. The operator first designates the picture 1 and then the picture 5 by use of the light pen 10 and thereafter manipulates an "Insert" key on the keyboard. The memory replacement control circuit 11 is thereby operated similarly to the above-mentioned replacement operation. As a result, the picture 5 is inserted between the pictures 1 and 2 and the pictures 2, 3 and 4 are shifted by one segment, in order, respectively. This insertion process, however, is liable to lead to error because, when the operator wishes to insert the picture 5 before the picture 2, he may erroneously designate the pictures 2 and 5 in this order by use of the light pen 10 and thereafter manipulate the "Insert" key without following the correct steps:

(47) $\underset{b}{1} \rightarrow \underset{b}{5} \rightarrow$, "Insert" key. This operation would result in the mistaken rearrangement: $\underset{b}{1}, \underset{b}{2}, \underset{b}{5}, \underset{b}{3}$ and 4.

To prevent such erroneous operation as this, in this embodiment, the intermediate region 13 is provided between the respective segments on the index screen, as indicated by the hatched region in Fig. 3. As described previously, this intermediate region 13 can be represented by the gate signals produced based on the horizontal and vertical sync signals and it can be detected on the basis of the gate signal obtained when the operator designates the intermediate region 13 by use of the light pen 10.

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Now it is assumed that the picture 5 is to be inserted between the pictures 1 and 2 by utilization of the intermediate region 13. In this case, the operator first designates the picture 5 and then the intermediate region 13 located between the pictures 1 and 2 and thereafter manipulates the "Insert" key on the keyboard. The respective outputs of the index number detecting circuit 9 and the "Insert" key are thereby fed to the memory replacement control circuit 11 and the insert operation for the "squeezed" pictures and the reference numerals is carried out. As a result, such a rearranged program as shown on the monitor screen 14 in Fig. 4 is obtained. As clearly understood from the foregoing, the aforesaid insertion process is extremely simple and any erroneous operation can be avoided.

An X-Y coordinate input device may be used as well as the light pen 10. This input device may be a conventional one which is formed by arranging transparent electro-conductive films and the like in the form of a key switch train 17 in a form of matrix as indicated in Fig. 5. The necessary pictures can be selected by disposing the transparent input device over the monitor screen so as to touch it directly and manipulating some of the coordinate keys corresponding to the "squeezed" index pictures on the monitor screen.

In addition, if a key switch train 15 corresponding to the intermediate region 13 of Fig. 3 is arranged between the key switch trains 17 located on the respective picture segments as shown in Fig. 5, they can be used at the time of insertion operation. Since the insertion operation is just similar to the case of the light pen, the operator first selects the pictures to be inserted by use of the key switch train 17 and then manipulates the key switch train 15 showing the position for insertion.

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As clearly understood from the foregoing, the picture processing apparatus of this invention is so constructed that the "squeezed" still pictures can be displayed on one screen divided into a plurality of segmented areas and each segment and the intermediate between the segments can be selected on the screen. Rearrangement operation of the multiple segmented screen, such as insertion operation, can be easily achieved without errors, by designating one of the segments and one of the intermediate regions.

Fig. 6 shows a detailed block diagram of the system of Fig. 1. In Fig. 6, a digitized video signal from the analog-digital converter 1 is stored in the picture memory 2 having a size corresponding a full TV frame area. A write address is supplied to the memory 2 from a full TV frame address generator 110 for recording the full frame picture data. The address consists of horizontal picture element and vertical addresses 1-910 incremented by one for each horizontal picture element and vertical addresses 1-525 incremented by one for each horizontal line. The content of the picture memory 2 is read out to be recorded on a track of the disk recording/reproducing apparatus 3. Read address is supplied from the full TV frame address generator 110 to the picture memory 2 at a slow rate corresponding to the recording speed of the disk apparatus 3.

For reducing a full frame image into $\frac{1}{16}$ of the original, a read address is supplied from the full TV frame address generator 110 through an address circuit 41 which passes only addresses having a bit pattern (01) in the rightmost two bits thereof. Addresses having other bit patterns (00, 10 and 11) in the rightmost two bits are not passed. It means that horizontal and vertical addresses representatives of $\frac{1}{16}$... are supplied

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to the picture memory 2 to read out a reduced picture being one-fourth both in horizontal and vertical directions. At the same time, a write address is supplied to a 1/16 memory 42 for storing the read-out reduced picture data from the picture memory

- 5 2. The write address is identical with the thinned out address from the ~~thinning~~^{address} thinning out circuit 41 but the rightmost two bits (01) thereof are deleted. The write address designates 1/16-sized memory area for storing the reduced picture image and
- 10 consists of horizontal H and vertical V addresses incrementing by
- (14) one, respectively 1-228 (H) and 1-132 (V).

The content of 1/16 memory 42 are read out and transferred to the disk apparatus 3 to be recorded on an index track thereof. A read address is supplied to the 1/16 memory 42

15 from a reduced area address generator 111 at a slow rate corresponding to the recording speed of the disk. The address generator 111 generates horizontal and vertical addresses

(14) H-address 1-228 and V-address 1-132 respectively.

- 20 The control circuit of the disk drive ~~33~~³ selects still picture tracks and reduced picture tracks in accordance with the signal to be recorded under the control of micro processor 114.

For reproduction, data representing a reproduced picture is stored in the picture memory 8 and the stored data is read out

25 to a monitor TV 12 (See Fig. 2) through the digital-analog converter 7. A write address and a read address are generated in the full TV frame address generator 110 and supplied to the picture memory 8. The rate of the write address is synchronized with the reproduction from disk 3 and the rate of the read address

30 is synchronized with the time base of the real video signal.

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The index memory 5 comprises a full TV frame memory 51 for storing data corresponding to one index still picture which consists of $\frac{1}{16}$ segmented areas in each of which a reduced picture corresponding to one full frame TV still picture is displayed.

- 5 Each of the multiple segmented areas corresponds to a predetermined location in the memory 51. Each of the predetermined locations has a unique address and stores the digital signals (i.e. data) for one reduced still picture image.
- 10 Write and read addresses are supplied in the same manner with the write and read operation of the picture memory 8, thus displaying an index picture on the monitor screen.

The index memory 5 further comprises two auxiliary memories 52 and 53 labeled as "A" and "B", which are employed for memory replacement control. Each of the auxiliary memories is the same size as the $\frac{1}{16}$ memory 42 for storing the data of one reduced picture. The reduced area address generator 111 supplies (14) write and read addresses (1-228 (H) and 1-132 (V)).

An area strobe signal generator 112 is provided in the memory replacement control circuit 11. The generator 112 generates a strobe signal corresponding to one of the segmented areas #1-#16 within one index picture. The strobe signal is generated in synchronism with the full frame address generation by (14) the full frame address generator 110.

Rearrangement of the reduced still pictures in the index picture will now be explained. "Rearrangement" and similar words are used to refer generically to either the exchange of locations of two reduced still pictures in the index picture or the movement of one reduced still picture image at an initial location in the index picture in a new location between a pair of adjacent reduced still pictures in the index picture. With

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respect to the described embodiment, rearrangement and similar terms refer to the steps of relocating reduced still picture image digital signals in the index memory among the predetermined memory locations to accomplish the aforesaid modifications to the index picture.

For exchange of two of $\frac{1}{b}$ segments in the index memory 51, the two segments, $\#6$ and $\#7$ for example, are designated by a light pen, the operation of which is detected by the index number detection circuit 9 and acknowledged to the micro processor 114.

The processor 11 gives a command signal to the area strobe signal generator 112 to generate $\#6$ and $\#7$ strobe signals in that order. The strobe signals are supplied to a gate circuit 113 for strobing a full frame read address from the address generator 110.

Strobed addresses corresponding to segments $\#6$ and $\#7$ are fed in this order to the index memory 51 for reading out the data in the segments $\#6$ and $\#7$. Simultaneously, write addresses are supplied from the reduced area address generator 111 to the auxiliary memories 52 and 53 in synchronism with respective timing of the strobe signals. As a result, contents of the segments $\#6$ and $\#7$ are respectively transferred to the memories 52 and 53

($\#6 \rightarrow A$, $\#7 \rightarrow B$).

Then, strobe signals for segments $\#7$ and $\#6$ are generated in that order to strobe and feed write addresses from the full TV frame address generator 110 to the index memory 51 through the gate circuit 113, while read addresses are supplied to the auxiliary memories 52 and 53 in synchronism with the strobe signals. As a result, contents of the auxiliary memories 52 and

53 are retransferred to the segment areas $\#7$ and $\#6$ ($A \rightarrow \#7$, $B \rightarrow \#6$), thus completing the exchange of reduced pictures digital signals stored in the index picture memory between the index memory locations for multiple segment locations $\#6$ and $\#7$.

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For insertion of one selected segment between two adjacent segments, a segment, for example, is first designated and then one of intermediate regions 13 located between a pair of segments, the region 13 between segments #1 and #2, for example, is designated by a light pen. The detecting circuit 9 detects these designations and sends appropriate signals to the micro processor 114. The micro processor 114 controls the full TV frame address generator 110, reduced area address generator 111 and area strobe signal generator 112 in the similar manner as explained in the exchange mode. Following five steps are carried out in the insertion operation.

- T150X
- (1) #5 → A
 - (2) #4 → B → #5
 - (3) #3 → B → #4
 - (4) #2 → B → #3
 - (5) A → #2

Segment #5 is moved to memory 52 for storage. Each segment #4 through #2 is moved to the remaining memory 53 (B) and then to the next higher segment location freeing the segment 2 location into which the contents of memory (52) is read. Consequently, the reduced picture in the #5 segment is inserted between segments #1 and #2 so as to complete the rearrangement shown in Fig. 4.

An index number memory 54 is employed in the index memory 5. In the index number memory 54, index numbers corresponding to the arrangement of index segment pictures on the index screen are stored under control of the micro processor 114. The content of the index number memory 54 is read out as a program schedule information to be used for on air control.

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This invention having been described in its preferred embodiments, it is clear that numerous modifications and changes may be made by those skilled in the art without departing from the broader scope and spirit of the invention.

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WHAT IS CLAIMED IS:

1. A picture processing system comprising a recording member in which a plurality of full TV screen still picture digital signals is recorded, each signal corresponding to a different still picture, and a monitoring means for reproducing one of said still picture digital signals and displaying the corresponding still picture on a screen, said recording member having an index recording portion in which a second plurality of digital signals is recorded, each digital signal of the second plurality corresponding to a reduced still picture and one reduced still picture digital signal being provided for each still picture, and said monitoring means including: index memory means for storing a group of reduced still picture digital signals from said recording member in predetermined memory locations as a single full TV screen index picture; circuit means for coupling the index memory means and said screen to display the group of said reduced still pictures stored in said index memory means in multiple segmented areas on said screen as an index picture; selecting means for designating multiple segmented areas on said screen to select reduced still pictures displayed in said areas; and memory control means for rearranging the locations of said reduced still picture digital signals stored in said index memory means on the basis of the output of said selecting means to rearrange the location of reduced still pictures in said index picture.

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NR 2. A picture processing system according to claim 1,
 wherein said selecting means comprises a light pen and a detecting
 circuit for detecting the position of said segmented areas
 designated by said light pen on the basis of horizontal and
 NR vertical sync signals for said screen.

3. A picture processing system according to claim 1,
 wherein said selecting means comprises a transparent keyboard unit
 provided on said screen, said keyboard unit comprising a matrix of
 keys, each key corresponding to each of said segmented areas.

NR 4. A picture processing system according to claim 2,
 wherein said detecting circuit comprises means for detecting
 intermediate regions respectively provided between adjacent
 segmented areas on said screen, and said memory control means
 5 receives a detecting signal corresponding to one of said
 intermediate regions for rearranging the contents of said index
 memory so that a selected one of said displayed reduced still
 pictures is interposed between two adjacent reduced pictures by
 designating an intermediate region between said two adjacent
 NR reduced pictures displayed on said screen.
 10

1/2. A picture processing system according to claim 3,
 wherein said transparent keyboard unit further comprises another
 matrix of keys, each key corresponding to each intermediate region
 respectively provided between each pair of adjacent segmented
 5 areas and said memory control means receives the output of one of
 said another matrix of keys corresponding to one of said
 intermediate regions for rearranging the contents of said index.

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memory so that a selected one of said displayed reduced pictures is interposed between two adjacent reduced pictures by designating an intermediate region between said two adjacent reduced pictures displayed on said screen.

6. A picture system comprising:

a recording member in which a plurality of still picture signals are recorded; and

a monitoring means for reproducing one of said recorded still picture signals for displaying said one still picture on a screen,

said recording member having an index recording portion in which a series of reduced picture signals representative of a plurality of reduced still pictures, each of which correspond to each of said still pictures, is recorded,

a group of said reduced still pictures being selectively displayed in multiple segmented areas formed on said screen as an index to said still pictures, said monitoring means comprising selecting means of a type operative by directly pointing to the surface of said screen for designating one of said multiple segmented areas to select one of said reduced still pictures and said monitoring means having a random access reproduction function to reproduce one of designated still pictures in response to designation with said selecting means.

7. A picture processing system according to claim 6, wherein said selecting means comprises a light pen and a detecting circuit for detecting the position of said segmented areas designated by said light pen on the basis of horizontal and vertical sync signals for said screen.

claims 5-9 →

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8. A picture comprising system according to claim 6,
 wherein said selecting means ^{further} comprises a transparent keyboard unit
 provided on said screen, said keyboard unit comprising a matrix of
 keys corresponding to said segmented areas.

9. A picture processing system according to claim 7,
 wherein said detecting circuit further comprises means for
 detecting intermediate regions respectively provided between two
 adjacent segmented areas on said screen, a detecting output
 thereof being utilized to rearrange the arrangement of said
 reduced still pictures on said screen.

10. A picture processing system according to claim 3,
 wherein said transparent keyboard unit further comprises another
 matrix of keys, each key respectively corresponding to an
 intermediate region between different pairs of adjacent segmented
 areas, said keys at the intermediate regions being utilized to
 rearrange the arrangement of said reduced still pictures on said
 screen.

11. A picture processing system comprising:
 a random access recording and playback member
 having a main recording portion in which a plurality of still
 picture signals are electronically recorded and an index recording
 portion in which a plurality of reduced still picture signals are
 electronically recorded, each of the reduced still pictures
 corresponding to a different one of said still pictures; and
 a monitoring means including: a screen for
 displaying either a group of said reduced still pictures in
 multiple segmented areas formed on said screen as an index to said
 still pictures, or one of said still pictures, selecting means for
 designating one of said multiple segmented areas to select the

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reduced still picture displayed therein by directly pointing to
the surface of said screen, and for controlling said random access
recording and playback member; and means for electronically
recording the signal of the one still picture corresponding to the
15 selected one of said reduced still pictures.

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ABSTRACT OF THE DISCLOSURE

A picture processing system for displaying a plurality of still pictures recorded in a recording member. The recording member has index tracks for storing a series of information representative of a plurality of squeezed still pictures corresponding to the original still pictures. A group of squeezed still pictures is displayed in multiple segmented areas formed on an index screen accompanied by reference numerals. A light pen and a sensing circuit is provided for rearranging the index screen. The light pen detects the position of said segmented areas and intermediate regions respectively provided between two adjacent areas for processing the rearrangement.

(1)

COMBINED DECLARATION AND POWER OF ATTORNEY

Attorney's Pocket No.

TS

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; that

I verily believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: PICTURE PROCESSING SYSTEM.

the specification of which

☒ is attached hereto.☐ was filed on _____ as Application

Serial No. _____ and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with 37 C.F.R. § 1.56(a).

I hereby claim foreign priority benefits under 35 U.S.C. § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of any application on which priority is claimed:

Country	Number	Date Filed	Priority Claimed
Japan	2531/1982	Jan. 11, 1982	<input checked="" type="checkbox"/>
Japan	6971/1982	Jan. 20, 1982	<input checked="" type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial No.	Filing Date	Status (patented, pending, abandoned)
United States Serial No. 455,115	Jan. 3, 1983	(will be abandoned upon filing date of this application)

AX203886

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: John Jamieson, Jr. and Norman L. Norris

Registration No. 29,546 and 24,196

of the firm of WOODCOCK WASHBURN KURTZ MACKIEWICZ & NORRIS, 1800 United Engineers Building, 30 South 17th Street, Philadelphia, Pennsylvania 19103.

Address all telephone calls and correspondence to John Jamieson, Jr.

Telephone No. 215-568-3100.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1	FULL NAME <u>Zenji Harada</u>	INVENTOR'S SIGNATURE	DATE
	RESIDENCE <u>Hyogo-ken, Japan</u>	CITIZENSHIP	
	POST OFFICE ADDRESS <u>1-25-2, Ugulleudai, Kawanishi-shi, Hyogo-ken, Japan</u>		
2	FULL NAME <u>Osamu Teraoka</u>	INVENTOR'S SIGNATURE	DATE
	RESIDENCE <u>Osaka, Japan</u>	CITIZENSHIP	
	POST OFFICE ADDRESS <u>13-7, Akasakadai 5-chome, Sakai-shi, Osaka, Japan</u>		
3	FULL NAME <u>Tsunao Mikado</u>	INVENTOR'S SIGNATURE	DATE
	RESIDENCE <u>Tokyo, Japan</u>	CITIZENSHIP	
	POST OFFICE ADDRESS <u>4-1-5-307, Shimomeguro, Meguro-ku, Tokyo, Japan</u>		
4	FULL NAME	INVENTOR'S SIGNATURE	DATE
	RESIDENCE	CITIZENSHIP	
	POST OFFICE ADDRESS		
5	FULL NAME	INVENTOR'S SIGNATURE	DATE
	RESIDENCE	CITIZENSHIP	
	POST OFFICE ADDRESS		
6	FULL NAME	INVENTOR'S SIGNATURE	DATE
	RESIDENCE	CITIZENSHIP	
	POST OFFICE ADDRESS		

AX203887

As Original Filed

TS-39

862041

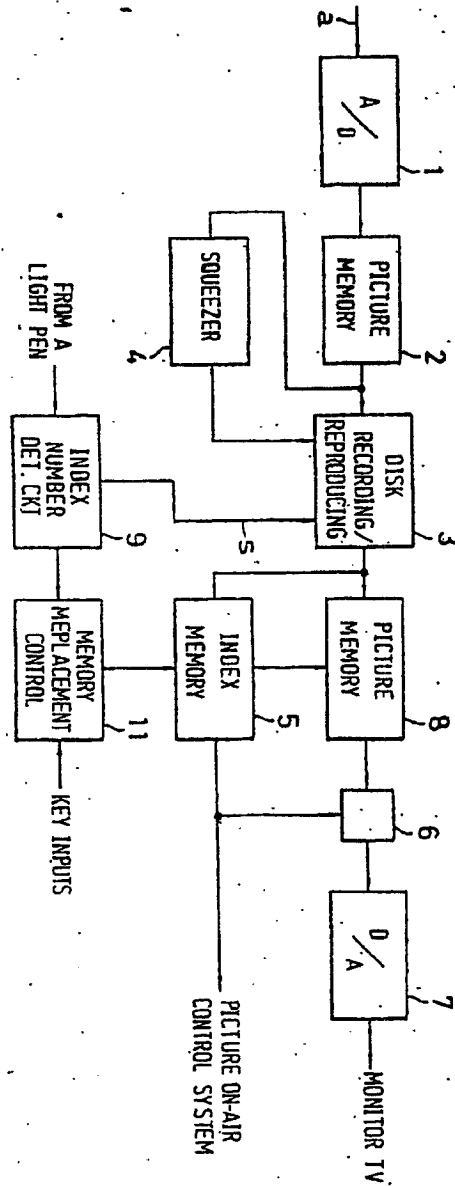


FIG. 1

AX203888

862041

FIG. 2

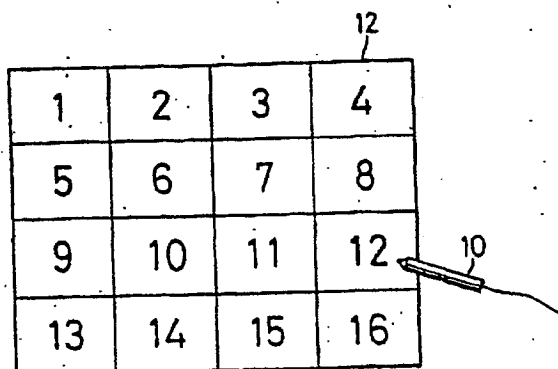
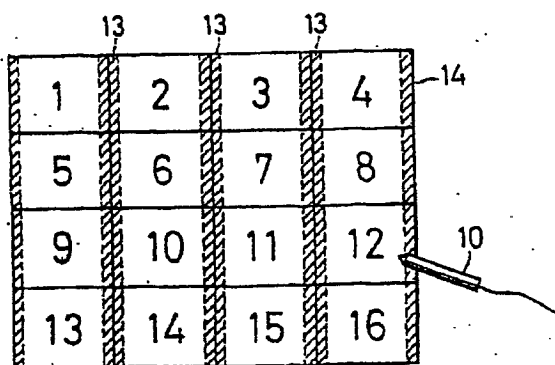


FIG. 3



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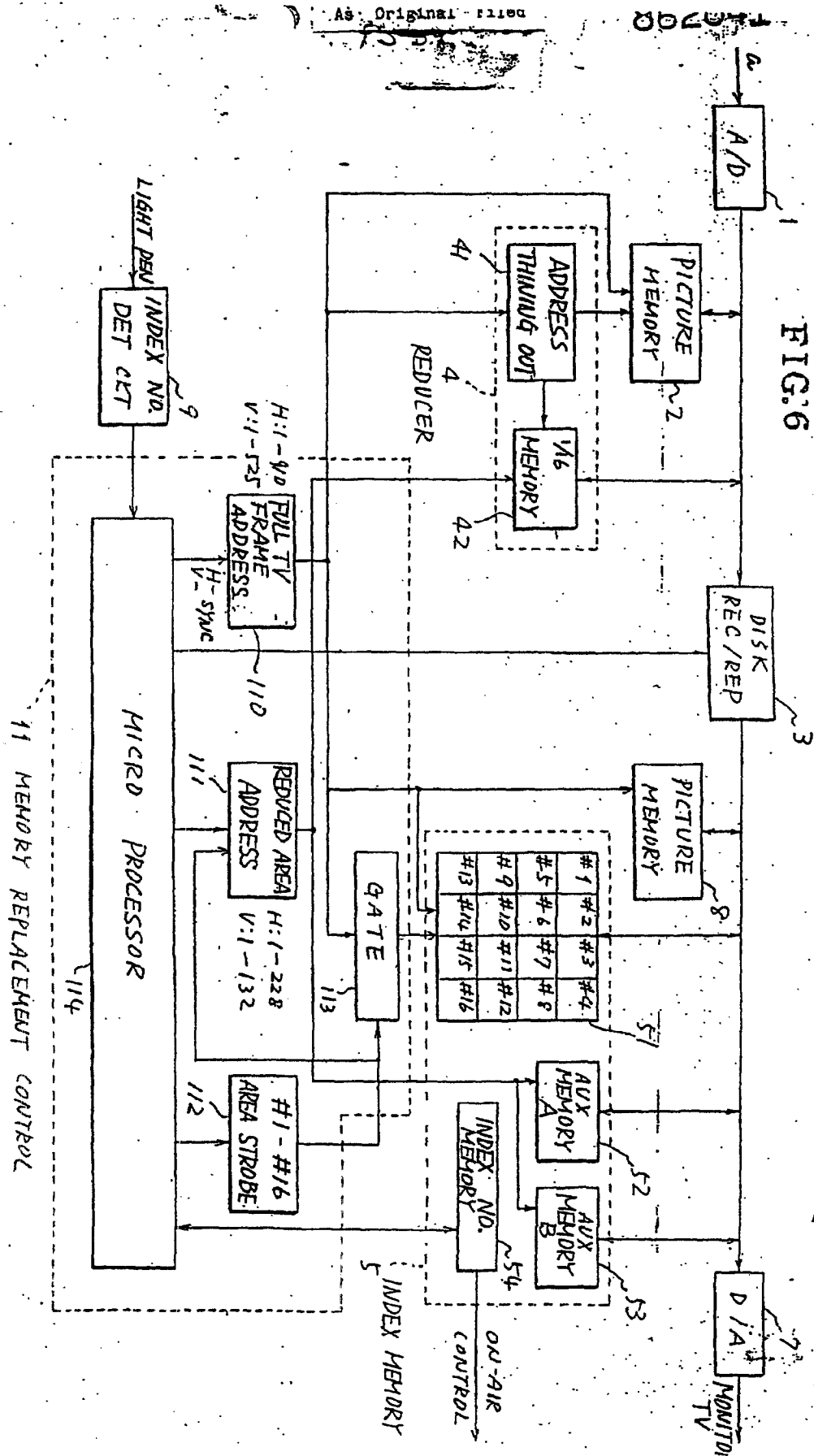
FIG. 4

1	5	2	3	14
4	6	7	8	
9	10	11	12	
13	14	15	16	

FIG. 5

17		15		16
1	2	3	4	
5	6	7	8	
9	10	11	12	
13	14	15	16	

AX203890



AX203891



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Woodcock, Washburn, Kurtz
Mackiewicz & Norrias
1800 United Engineers Building
30 South 17th St.
Philadelphia, PA 19103

MAILED

JUN 30 1986

Applicant(s): Zenji Harada ET AL
Serial Number: 862,041X
Filing Date: 5/12/86
Title: PICTURE PROCESSING SYSTEM

AFFIDAVIT DIVISION
PATENT & TRADEMARK OFFICE

Notice to File Missing Parts of Application-
Filing Date Granted

If all missing parts are filed within the period set below, the total amount owed by applicant as a ☒ large entity, ☐ small entity (verified statement filed), is \$ 110.00

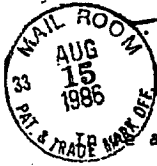
1. ☐ The statutory basic filing fee is: ☐ missing ☐ insufficient. Applicant as a ☐ large entity, ☐ small entity, must submit \$ _____ to complete the basic filing fee and MUST ALSO SUBMIT THE SURCHARGE AS INDICATED BELOW.
2. ☐ Additional claim fees of \$ _____ as a ☐ large entity, ☐ small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due. NO SURCHARGE IS REQUIRED FOR THIS ITEM.
3. ☐ The oath or declaration is:
 - ☐ missing.
 - ☐ does not cover items omitted at the time of execution.
 An oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Serial Number and Filing Date is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
4. ☐ The oath or declaration does not identify the application to which it applies. An oath or declaration in compliance with 37 CFR 1.63 identifying the application by the above Serial Number and Filing Date is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
5. ☒ The signature to the oath or declaration is: ☒ missing; ☐ a reproduction; ☐ by a person other than the inventor or a person qualified under 37 CFR 1.42, 1.43, or 1.47. A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Serial Number and Filing Date is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
6. ☐ The signature of the following joint inventor(s) is missing from the oath or declaration: _____. Applicant(s) should provide, if possible, an oath or declaration signed by the omitted inventor(s), identifying this application by the above Serial Number and Filing Date. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
7. ☐ The application was filed in a language other than English. Applicant must file a verified English translation of the application and a fee of \$26.00 under 37 CFR 1.17(k), unless this fee has already been paid. NO SURCHARGE IS REQUIRED FOR THIS ITEM.
8. ☒ Other: 110.00 Required for Surcharge

A Serial Number and Filing Date have been assigned to this application. However, to avoid abandonment under 37 CFR 1.53(d), the missing parts and fees identified above in Items 1 and 3-6 must be timely provided ALONG WITH THE PAYMENT OF A SURCHARGE OF \$110.00 for large entities or \$55.00 for small entities who have filed a verified statement claiming such status. The surcharge is set forth in 37 CFR 1.16(e). Applicant is given ONE MONTH FROM THE DATE OF THIS LETTER, OR TWO MONTHS FROM THE FILING DATE of this application, WHICHEVER IS LATER, within which to file all missing parts and pay any fees. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.134(e).

Direct the response to, and any questions about, this notice to the undersigned, Attention, Application Branch, and include the above Serial Number and Filing Date.

[Signature]
Patent Application Branch
(705) 557-3259

AX203892



110-00-115 #3
56:00-115 #N
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

application of:

Zenji Harada, Osamu Teraoka and Tsuneo Mikada

Serial No.: 862,041

Group Art Unit:

Filed: May 12, 1986

Examiner:

For: PICTURE PROCESSING SYSTEM

RECEIVED
AUG 22 1986

ASSIGNMENT

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Dear Sir:

TRANSMITTAL LETTER

In response to the Notice To File Missing Parts of application mailed June 30, 1986, enclosed for filing in the above identified application is an executed Combined Declaration and power of Attorney form. A one-month extension of time to August 29, 1986 is also hereby requested.

Enclosed is a check in the amount of \$166.00 covering the \$110.00 surcharge for late filing of the Declaration and an extension of time fee for response within the first month.

The Commissioner is hereby authorized to charge payment of any fee or to credit any overpayment to Deposit Account No. 23-3050. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

John Jamieson, Jr.
Registration No. 29,546

Date: Aug. 12, 1986

JJJr/rc

WOODCOCK WASHBURN KURTZ
MACKIEWICZ & ASSOCIATES 862041
1800 United Engineers Building
30 South 17th Street
Philadelphia, PA 19103

1 115 56.00 CK

(215) 568-3100

I hereby certify that this correspondence is being deposited with the United States Patent and Trademark Office in accordance with the provisions of the Patent and Trademark Act, Washington D.C. 20231 on Aug. 12, 1986

John Jamieson, Jr.
Registration No. 29,546
Aug. 12, 1986

AX203893



COMBINED DECLARATION AND POWER OF ATTORNEY

Attorney Docket No.

75-89

I, a below named inventor, I hereby declare that:
my residence, post office address and citizenship are as stated below next to my name; that

I verily believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PICTURE PROCESSING SYSTEM

the specification of which

☐ is attached hereto.

☒ was filed on May 12, 1986 as Application

Serial No. 862,041 and was amended on N/A
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with 37 C.F.R. § 1.56(a).

I hereby claim foreign priority benefits under 35 U.S.C. § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of any application on which priority is claimed:

Country	Number	Date Filed	Priority Claimed
<u>Japan</u>	<u>2531/1982</u>	<u>Jan. 11, 1982</u>	<input checked="" type="checkbox"/>
<u>Japan</u>	<u>6971/1982</u>	<u>Jan. 20, 1982</u>	<input checked="" type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial No.	Filing Date	Status (patented, pending, abandoned) (will be abandoned upon filing date of this application)
<u>United States</u>	<u>Jan. 3, 1983</u>	
<u>Serial No. 455,115</u>		

AX203894

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Norman L. Norris and John Jamieson, Jr.

Registration No. 28,196 and 29,546

⁶⁰¹ of the firm of ⁶⁰² WOODCOCK WASHBURN KURTZ MACKIEWICZ & NORRIS, 1800 United Engineers Building, 30 South 17th Street, Philadelphia, Pennsylvania 19103.

Address all telephone calls and correspondence to John Jamieson, Jr.

Telephone No. (215) 568-3100.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1	FULL NAME <u>Zenji Harada</u>	INVENTOR'S SIGNATURE <u>Z. Harada</u>	DATE <u>Aug. 1, 1986</u>
	RESIDENCE <u>Hyogo-ken, Japan</u>		
	CITIZENSHIP <u>JAPAN</u>		
	POST OFFICE ADDRESS <u>2-25-2, Uguisudai, Kawanishi-shi, Hyogo-ken, Japan</u>		
2	FULL NAME <u>Osamu Teraoka</u>	INVENTOR'S SIGNATURE <u>Osamu Teraoka</u>	DATE <u>Aug. 1, 1986</u>
	RESIDENCE <u>Osaka, Japan</u>		
	CITIZENSHIP <u>JAPAN</u>		
	POST OFFICE ADDRESS <u>13-7, Akasakadai 5-chome, Sakai-shi, Osaka, Japan</u>		
3	FULL NAME <u>Tsunao Mikado</u>	INVENTOR'S SIGNATURE <u>T. Mikado</u>	DATE <u>Aug. 1, 1986</u>
	RESIDENCE <u>Tokyo, Japan</u>		
	CITIZENSHIP <u>JAPAN</u>		
	POST OFFICE ADDRESS <u>4-1-5-307, Shimomeguro, Meguro-ku, Tokyo, Japan</u>		
4	FULL NAME	INVENTOR'S SIGNATURE	DATE
	RESIDENCE		
	CITIZENSHIP		
	POST OFFICE ADDRESS		
5	FULL NAME	INVENTOR'S SIGNATURE	DATE
	RESIDENCE		
	CITIZENSHIP		
	POST OFFICE ADDRESS		
6	FULL NAME	INVENTOR'S SIGNATURE	DATE
	RESIDENCE		
	CITIZENSHIP		
	POST OFFICE ADDRESS		

AX203895

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: ZENJI HARADA, OSAMU TERRAKA, TSUNEO MIRADO
For: PICTURE PROCESSING SYSTEM

ASSOCIATE POWER OF ATTORNEY

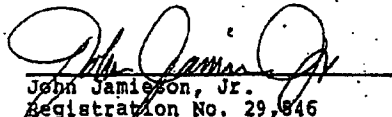
Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Dear Sir:

The undersigned, John Jamieson, Jr., Registration No.
29,546, of the firm WOODCOCK WASHBURN KURTZ MACKIEWICZ & NORRIS,
1800 United Engineers Building, 30 South 17th Street,
Philadelphia, Pennsylvania 19103, attorney for Applicant(s),
hereby appoints the following:

ROBERT B. WASHBURN	REGISTRATION NO. 16,574
RICHARD E. KURTZ	REGISTRATION NO. 19,263
JOHN J. MACKIEWICZ	REGISTRATION NO. 19,709
ALBERT W. PRESTON, JR.	REGISTRATION NO. 25,366
NORMAN L. NORRIS	REGISTRATION NO. 24,196
DALE M. HEIST	REGISTRATION NO. 28,425
JOHN W. CALDWELL	REGISTRATION NO. 28,937
PHILIP S. JOHNSON	REGISTRATION NO. 27,200
GARY H. LEVIN	REGISTRATION NO. 28,734
JAMES R. BURDETT	REGISTRATION NO. 31,594

his associates with full power to prosecute the above-identified
application, to transact all business in the Patent Office
connected therewith and requests that correspondence continue to
be directed to the firm of WOODCOCK WASHBURN KURTZ MACKIEWICZ &
NORRIS at the above address.


John Jamieson, Jr.
Registration No. 29,546
Attorney for Applicant(s)

Dated: May 10, 1986

AX203896

Form PTO-1082

CASE DOCKET NO. TS-39

THE COMMISSIONER OF PATENTS

MAIL DATE CANCELLED
MAY 12 1986

REMARKS

862041

"EXPRESS MAIL" Mailing Label No. B63955752

Date of Deposit: May 10, 1986
 I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Inventor: ZENJI HARADA, OSAMA
 TERAOKA, TSUNEO MIKADO

For: PICTURE PROCESSING SYSTEM

John Jamieson, Jr., Reg. #29,546

Enclosed are:

- ☒ four sheets of drawing. (informal)
☐ An assignment of the invention to _____

☐ A certified copy of a _____ application.

☒ An associate power of attorney.

☒ An unexecuted Declaration and Power of Attorney.
☐ A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27.

☒ This is a continuation-in-part of Serial No. 455,115 filed January 3, 1983. Please transfer the drawings from the prior application to this application, and abandon said prior appln. as of the filing date accorded this appln.***
 The filing fee has been calculated as shown below:

	(Col. 1)	(Col. 2)
FOR:	NO. FILED	NO. EXTRA
BASIC FEE		
TOTAL CLAIMS	11 - 20 = *	0
INDEP CLAIMS	3 - 3 = *	0
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENTED		

* If the difference in Col. 1 is less than zero, enter "0" in Col. 2

SMALL ENTITY

RATE	FEE	OR
	\$ 170	OR
x 6 =	\$	OR
x 17 =	\$	OR
+55 =	\$	OR
TOTAL	\$	OR

OTHER THAN A SMALL ENTITY

RATE	FEE
	\$340
x 12 =	\$ 0
x 34 =	\$ 0
+110 =	\$
TOTAL	\$340

☐ Please charge my Deposit Account No. _____ in the amount of \$ _____. A duplicate copy of this sheet is enclosed.

☒ A check in the amount of \$ 340.00 to cover the filing fee is enclosed.

☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 23-3050. A duplicate copy of this sheet is enclosed.

☒ Any additional filing fees required under 37 CFR 1.16, including fees for presentation of extra claims.

☒ Any patent application processing fees under 37 CFR 1.17 and under 37 CFR 1.20 (d).

☒ The Commissioner is hereby authorized to charge payment of the following fees during the pendency of this application or credit any overpayment to Deposit Account No. 23-3050. A duplicate copy of this sheet is enclosed.

☒ Any patent application processing fees under 37 CFR 1.17 and under 37 CFR 1.20 (d).

☐ The issue fee set in 37 CFR 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).

☒ Any filing fees under 37 CFR 1.16 including fees for presentation of extra claims.

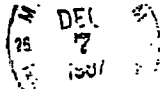
May 10, 1986

Date

*** A duplicate copy of this sheet is enclosed for filing in the prior application file.

(Attorney of Record) John Jamieson, Jr.
 Reg. No. 29,546

AX203897



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U ~ ~
#6

RECEIVED
GROUP 230

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

1987 DEC -7 PM 5:03

In re application of

Socket Number: TS 0039
Serial Number: 862041
Filing Date: 12/11/86
Inventors: HARADA ZENJI
MIKADA TSUMEO
Title: PICTURE PROCESSING SYSTEM

TERADA ASAMU

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Dear Sir:

NOTIFICATION OF CHANGE OF CORRESPONDENCE ADDRESS

Please be advised that effective as of December 15, 1987, the correspondence address and telephone number for the attorney of record and associate attorneys of record for the above application has been changed to the following:

Woodcock Washburn Kurtz Mackiewicz & Norris
One Liberty Place - 46th Floor
Philadelphia, PA 19103

Phone: (215) 568-3100

Please make this change of record in the above identified application. An original notification of change of firm address relating to this and numerous other applications has been filed with the Office of the Solicitor.

Respectfully submitted,

Dale M. Helst
Registration No. 28,425

Date: *December 1, 1987*

WOODCOCK WASHBURN KURTZ
MACKIEWICZ & NORRIS
1800 United Engineers Building
30 South 17th Street
Philadelphia, PA 19103
(215) 568-3100

AX203898


UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

 Address : COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
06/502,041	05/12/86	REPAIR	2 18-39

 WOODCOCK, WASHBURN, KURTZ,
 MACKIEWICZ & MORRIS
 1000 UNITED ENGINEERS BLDG.
 30 SOUTH 17TH ST.
 PHILADELPHIA, PA 19103

EXAMINER	
FAERK, R	
ART UNIT	PAPER NUMBER
235	7

DATE MAILED: 12/23/87

This is a communication from the examiner in charge of your application.

COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined ☒ Responsive to communication filed on 5/12/86 ☐ This action is made final.

 A shortened statutory period for response to this action is set to expire THREE month(s), _____ days from the date of this letter.
 Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input checked="" type="checkbox"/> Notice re Patent Drawing, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449 | 4. <input type="checkbox"/> Notice of Informal Patent Application, Form PTO-152 |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474 | 6. <input type="checkbox"/> _____ |

Part II SUMMARY OF ACTION

1. ☒ Claims 1-11 are pending in the application.
 Of the above, claims _____ are withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 1-11 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☒ This application has been filed with informal drawings which are acceptable for examination purposes until such time as allowable subject matter is indicated.
8. ☐ Allowable subject matter having been indicated, formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. These drawings are ☐ acceptable;
☐ not acceptable (see explanation).
10. ☐ The ☐ proposed drawing correction and/or the ☐ proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved. ☐ disapproved (see explanation). However, the Patent and Trademark Office no longer makes drawing changes. It is now applicant's responsibility to ensure that the drawings are corrected. Corrections **MUST** be effected in accordance with the instructions set forth on the attached letter "INFORMATION ON HOW TO EFFECT DRAWING CHANGES", PTO-1474.
12. ☒ Acknowledgment is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received
☒ been filed in parent application, serial no. 455115; filed on 11/3/83.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

AX203899

Serial No. 862041

-2-

Art Unit 235

The declaration of August 15, 1986 appears to be proper.

The figure 6 drawing is informal.

Where is disk drive 331, noted on P.12, in the drawing ?.

It is noted that the co-assignee failed to apprise the examiner of the existence of related copending Serial No. 767655 during the prosecution of parent application Serial No. 455115. See MPEP 2001.06(b).

1. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103.

AX203900

Serial No. 862041

-3-

Art Unit 235

3. Claims 1-11 are rejected under 35 U.S.C. 103 as being unpatentable over Tsuyuguchi in view of Kishi.

Tsuyuguchi shows a recording member 22, a monitor 110, and index (col. 7, lines 38-60). The use of picture reduction, storage, and selection are mere design. See Kishi.

A. Faber/ayc

(703) 557-2065

12-4-87



AX203901

7C

D TOP AND BOTTOM EDGES, AND

CARBON

FORM PTO-892 (REV. 3-78)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 862041	GROUP/ART UNIT 235	ATTACHMENT TO PAPER NUMBER	
NOTICE OF REFERENCES CITED				APPLICANT(S) <i>Harada</i>			
U.S. PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE IF APPROPRIATE	
A	4,321,635	3-1982	<i>Tsuruguchi</i>	360	72.2		
B	4,366,475	12-1982	<i>Kilby</i>	340	731		
C	4,484,192	11-1984	<i>Leitz</i>	340	721		
D	4,670,710	1-1978	<i>Subanich</i>	364	900		
E	4,395,707	7-1983	<i>Setrag</i>	340	703		
F	4,317,114	2-1982	<i>Walker</i>	340	721		
G	4,658,840	11-1977	<i>Kaspryz</i>	360	35.1		
H	3,825,674	7-1974	<i>Postels</i>	358	183		
I	4,266,242	5-1981	<i>The Gay</i>	358	22		
J	3,801,741	4-1974	<i>Allet</i>	340	707		
K	4,107,780	8-1978	<i>Grunwaldt</i>	340	721		
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS	PERTINENT SHTS. DWG. SPEC.
L							
M							
N							
O							
P							
Q							
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)							
R							
S							
T							
U							
EXAMINER <i>Faher</i>				DATE 12/1/87			
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05 (a).)							

AX203902

PTO - 948
(Rev. 8-82)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICEATTACHMENT TO
PAPER NUMBER

GROUP

S.N.

822041

NOTICE OF PATENT DRAWINGS OBJECTION

Drawing Corrections and/or new drawings may only be submitted in the manner set forth in the attached letter, "Information on How to Effect Drawing Changes" PTO-1474.

- A. ☒ The drawings, filed on 5/10/88, are objected to as informal for reason(s) checked below:
- | | |
|---|--|
| 1. <input type="checkbox"/> Lines Faint. | 11. <input type="checkbox"/> Parts in Section Must Be Hatched. |
| 2. <input checked="" type="checkbox"/> <i>Copy machine marks</i>
Paper Poor. | 12. <input type="checkbox"/> Solid Black Objectable. |
| 3. <input type="checkbox"/> Numerals Poor. | 13. <input type="checkbox"/> Figure Legends Placed Incorrectly. |
| 4. <input type="checkbox"/> Lines Rough and Blurred. | 14. <input type="checkbox"/> Mounted Photographs. |
| 5. <input type="checkbox"/> Shrink Lines Required. | 15. <input type="checkbox"/> Extraneous Matter Objectable.
[37 CFR 1.84 (1)] |
| 6. <input type="checkbox"/> Figures Must be Numbered. | 16. <input type="checkbox"/> Paper Undersized; either 8 1/2" x 14",
or 21.0 cm. x 29.7 cm. required. |
| 7. <input checked="" type="checkbox"/> <i>Fig. 6</i>
Heading Space Required. | 17. <input type="checkbox"/> Proper A4 Margins Required:
<input type="checkbox"/> TOP 2.5 cm. <input type="checkbox"/> RIGHT 1.5 cm.
<input type="checkbox"/> LEFT 2.5 cm. <input type="checkbox"/> BOTTOM 1.0 cm. |
| 8. <input type="checkbox"/> Figures Must Not be Connected. | 18. <input checked="" type="checkbox"/> Other:
<i>1/4" margin required
right side Fig. 6</i> |
| 9. <input type="checkbox"/> Criss-Cross Hatching Objectable. | |
| 10. <input type="checkbox"/> Double-Line Hatching Objectable. | |
- B. ☒ The drawings, submitted on 5/10/88, are so informal they cannot be corrected. New drawings are required. Submission of the new drawings MUST be made in accordance with the attached letter.

AX203903



Case Docket No. TS-39

In re application of ZENJI HARADA, ASAMU TERAOKA AND
TSUMEO MIKADA

Serial No. 862,041 Group Art Unit: 235

Filed May 12, 1986

For PICTURE PROCESSING SYSTEM

THE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Sir:

Transmitted herewith is an amendment in the above-identified application.

- ☐ Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted.
- ☐ A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.

The fee has been calculated as shown below:

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR		PRESENT EXTRA	SMALL ENTITY		OTHER THAN A SMALL ENTITY	
						RATE	ADDIT. FEE	RATE	ADDIT. FEE
TOTAL	9	MINUS	20	=	0	x 6 ⁰⁰		x 12 ⁰⁰	
			(at least 20)						
INDEP.	3	MINUS	3	=	0	x 17 ⁰⁰		x 34 ⁰⁰	
			(at least 3)						
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM						+ 55 ⁰⁰		+ 110 ⁰⁰	

Total additional fee for amended claims

-0-

- ☒ Petition is hereby made under 37 C.F.R. §1.136(a) to extend the time for response to the Office Action of December 23, 1987 to and through May 23, 1988, comprising an extension of the shortened statutory period of:

	SMALL ENTITY	OTHER THAN SMALL ENTITY
one month	<input type="checkbox"/> \$ 28	<input type="checkbox"/> \$ 56
two months	<input type="checkbox"/> \$ 85	<input checked="" type="checkbox"/> \$ 170
three months	<input type="checkbox"/> \$ 195	<input type="checkbox"/> \$ 390
four months	<input type="checkbox"/> \$ 305	<input type="checkbox"/> \$ 610

Additional fee for extended response

170.

Applicant(s) has/have not been notified that the requested extension will not be permitted. The present application is not involved in an interference declared pursuant to 37 C.F.R. §1.207.

Total additional fee required

170.00

090 06/02/88 862041

1 116 170.00 CK

AX203904

Case Docket No. TS-39

- ☒ A check in the amount of \$ 170.00 is attached.
- ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____.
A duplicate of this sheet is attached.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associate with this communication or credit any overpayment to Deposit Account No. _____.
A duplicate copy of this sheet is attached.
- ☒ Any filing fees under 37 C.F.R. 1.16 including fees for presentation of extra claims.
- ☒ Any patent application processing fees under 37 C.F.R. 1.17 and under 37 C.F.R. 1.20(d).

May 23, 1988
(Date)

Michael Bush
Attorney of Record Michael S. Bush
Registration No. 31,745

CERTIFICATE OF MAILING

I hereby certify that this correspondence and all correspondence identified as accompanying this correspondence is being deposited with the United States Postal service as first class mail in an envelope addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on May 22, 1988.

Michael Bush Registration No. 31,745

AX203905